

**REMARKS**

In this Amendment after Final, Applicants propose amending claims 1 and 21 to more appropriately define the invention, and adding new claim 24 to protect additional aspects of the present invention. Applicants submit that the amendments contain no new matter, in accordance with the requirements of 37 C.F.R. § 1.121(f). Upon entry of this Amendment after Final, claims 1 – 24 remain pending, with claims 1 – 5 and 21 – 24 under current examination, and claims 6 – 20 withdrawn from consideration as drawn to a nonelected invention.

**Regarding the Office Action:**

In the Final Office Action, the Examiner rejected claims 1 – 5 under 35 U.S.C. § 103(a) as unpatentable over Gotoh, et al. (U.S. Patent No. 5,650,041) in view of Chapman (U.S. Patent No. 5,976,769) and Barker (U.S. Patent No. 5,185,278); and rejected claims 21 – 23 under 35 U.S.C. § 103(a) as unpatentable over Gotoh in view of Chapman, Barker, and Harada, et al. (U.S. Patent No. 6,251,774B1).

Applicants appreciate the Examiner's thorough examination of this application, especially the detailed citations which aided Applicants in reviewing the Examiner's comments. Applicants respectfully traverse the rejections, as detailed above, for the reasons presented below.

**Procedural Issues:**

Applicants respectfully request that the Examiner acknowledge Applicants' claim for foreign priority from Japanese Patent Application No. 11-183908, filed June 29, 1999. A certified copy of the priority document was filed on May 8, 2001.

**Regarding the Amendments to Claims 1 and 21:**

Applicants propose amending claims 1 and 21 to more appropriately define the invention. Applicants submit that the amendments contain no new matter, in accordance with the requirements of 37 C.F.R. § 1.121(f).

Applicants also direct the Examiner to the specification at page 10, lines 3 – 9, page 13, lines 7 – 10, and page 17, lines 15 – 19, as exemplary sections demonstrating support, among other places, for the amended language of claims 1 and 21. Applicants respectfully remind the Examiner that “[a]mendments to an application which are supported in the original description are NOT new matter.” M.P.E.P. § 2163.07, 8<sup>th</sup> Ed., Aug. 2001, p. 2100-172, emphasis in original.

Applicants submit that these amendments should render the application in condition for allowance after consideration of the remarks that follow, and should not place any burden on the Examiner insofar as raising new issues or requiring further searches of the art for him to reconsider these claims, as amended.

**Regarding New Claim 24**

Applicants have introduced new claim 24 to provide coverage for other aspects of Applicants’ invention. Applicants submit that new claim 24 is supported by the originally filed application, containing similar recitations as original claim 2, and therefore does not constitute new matter.

**Regarding the Rejection of Claims 1 – 5 under 35 U.S.C. § 103(a):**

Applicants respectfully traverse the rejection of claims 1 – 5 under 35 U.S.C. § 103(a) as unpatentable over Gotoh in view of Chapman and Barker. Applicants respectfully disagree with

the Examiner's arguments and conclusions, and respectfully submit that a *prima facie* case of obviousness has not been established.

In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim elements. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine reference teachings. Third, there must be a reasonable expectation of success. *See* M.P.E.P. § 2143.

The Examiner does not show that all the elements of Applicants' claims are met in the cited references, does not show that there is any suggestion or motivation to modify the cited references to result in the claimed invention, and does not show there would be any reasonable expectation of success from so doing.

*Prior Art Reference Must Teach or Suggest All the Claim Elements*

Applicants dispute the Examiner's contention that Gotoh in view of Chapman and Barker teach or suggest each and every element of Applicants' claimed invention.

To begin, Applicants respectfully point out to the Examiner that it "is *impermissible* within the framework of section 103 *to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary* to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *See In re Wesslau*, 147 U.S.P.Q. 391 (C.C.P.A. 1965), emphasis added. *See also* M.P.E.P. § 2141.02.

Applicants submit that, for the reasons detailed below, the Examiner is only using so much of the cited references to support the Examiner's position, to the exclusion of other parts necessary to give a full appreciation of what the references fairly suggest to one of ordinary skill in the art.

Applicants' independent claim 1 recites, among other things, "forming a soluble thin film by distributing and baking a coating solution on a film to be processed which is formed on a semiconductor substrate, wherein the soluble thin film is soluble in a dissolving liquid and contains an inorganic compound."

To explain how Applicants' claimed invention is distinguishable from Gotoh, Chapman, and Barker, Applicants raise the following points. First, regarding Gotoh, the Examiner admitted that Gotoh does not teach or suggest all the elements of Applicants' claimed invention:

"Gotoh et al. fail to teach forming a soluble thin film which is soluble in a dissolving liquid on a film to be processed which is formed on the semiconductor substrate, wherein said soluble thin film comprises titanium nitride; and dissolving an etched soluble thin film in the dissolving liquid, thereby lifting off the mask pattern from the film to be processed" (Final Office Action, page 2).

Furthermore, Gotoh does not teach or suggest at least Applicants' claimed "soluble thin film ... contain[ing] an inorganic compound" (claim 1). In contrast to the present invention, Gotoh's Fig. 2(a) shows multilayer resist 3 comprising lower resist mask layer 4 consisting of Novolak resin, intermediate mask layer 5 consisting of SOG, and upper resist mask layer 6 using a conventional negative or positive-type resist. *See also* Gotoh, col. 4, lines 5 – 15. As such, lower resist mask layer 4 and intermediate mask layer 5 are not photoresist layers, and all layers 3, 4, and 5 are not inorganic compounds.

Second, Applicants submit that Chapman fails to teach or suggest all the elements of Applicants' independent claim 1. While Chapman does teach dissolving "TiN layer 917-918 in a solution such as SCl (1 part 29%  $\text{NH}_4\text{OH}$ , 1 part 30%  $\text{H}_2\text{O}_2$ , and 6 parts  $\text{H}_2\text{O}$ )" (column 6, lines 29 – 30), Chapman also teaches that the TiN intermediate layer portions are formed by deposition ("TiN deposition may be by sputtering Ti in a  $\text{N}_2$  plasma or sputtering TiN" (column

5, lines 23 – 25)). As such, Chapman's col. 1, lines 53 – 54 are directed to achieving simple and complete removal of photoresist residue. For example, Chapman's Figs. 9(a) and 9(b) show that TiN 917-918 are used in order to prevent hardened photoresist portions 913-914 from remaining on polysilicon 906. This is clearly different from at least the elements of Applicants' claim 1 quoted above.

Third, Applicants note that the Examiner also admitted deficiencies regarding the combination of Gotoh and Chapman, in that "[t]he combined teachings of Gotoh et al. and Chapman fail to teach forming the soluble film by distributing and baking a coating solution" (Final Office Action, p. 3). Despite the Examiner's contentions that Barker cures this deficiency, Applicants submit that Barker also fails to teach or suggest the elements of Applicants' independent claim 1 that Gotoh and Chapman fail to teach or suggest.

Fourth, Applicants submit that Barker fails to teach or suggest all the elements of Applicants' independent claim 1, and therefore fails to cure the deficiencies of Gotoh and Chapman, taken alone or in combination. For example, Barker does not teach or suggest at least Applicants' claimed "soluble thin film ... contain[ing] an inorganic compound" (claim 1). In contrast, Barker's first layer 14 is polyimide. *See* Barker, col. 3, lines 4 – 9.

This clearly demonstrates how Gotoh, Chapman, and Barker are different from the present invention as claimed. Since the deficiencies of Gotoh, Chapman, and Barker actually compound, Gotoh, Chapman, and Barker, taken alone or in combination, still do not combine to teach or suggest at least the above-quoted elements of Applicants' independent claim 1.

Applicants therefore submit that the Examiner is using only so much of the cited references that will support the Examiner's position to the exclusion of other necessary parts to enable one of ordinary skill in the art to fully appreciate it.

This conclusively demonstrates just some of the differences between Gotoh, Chapman, Barker, and Applicants' present claimed invention. The Examiner has therefore not met at least one of the essential criteria for establishing a *prima facie* case of obviousness, wherein "the prior art reference (or references when combined) must teach or suggest all the claim limitations." See M.P.E.P. §§ 2142, 2143, and 2143.03.

*Suggestion or Motivation to Modify or Combine Reference Teachings*

The M.P.E.P. sets forth:

"However, "The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. *The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device.*" *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984)." M.P.E.P. § 2144.04, italics added.

As such, the present invention, as recited in independent claim 1, cannot be attained based merely on Gotoh, or on a combination of Gotoh with either or both of Chapman and Barker. One skilled in the art would only arrive at the present claimed invention by consulting Applicants' disclosure. Therefore, the only way to construct the claimed invention from the cited references would be to rely on aspects related to the present invention. Such reliance, however, would constitute improper hindsight reasoning. Applicants submit that these references, while all concerned with photolithography processing, actually diverge from each other in aim and scope, and therefore also teach away from the present invention.

First, Applicants have already demonstrated that a worker in the art would not be able to combined parts of Gotoh, Chapman, and Barker to produce Applicants' claimed invention, and

the combination of these references still would not teach or suggest at least the above-quoted elements of Applicants' independent claim 1. Second, Applicants have also demonstrated that the cited references teach away from the present invention since their methodology diverges, and therefore they cannot provide any motivation or reason for one of ordinary skill in the art to modify the references, or combine them, to produce the present claimed invention. Third, Applicants note that one of ordinary skill in the art must have this motivation or reason *without the benefit of Applicants' specification* to modify the references.

As already demonstrated, such combination of these references *a priori* fails to establish obviousness of the claimed invention. Furthermore, Applicants have pointed out deficiencies in the cited prior art that render nugatory any indication that the cited references would give any motivation or reason to one of ordinary skill in the art to modify them *without the benefits of Applicants' specification*.

Therefore, Applicants submit that Gotoh, Chapman, and Barker do not suggest the desirability of any modification to result in Applicants' claimed invention.

*Reasonable Expectation of Success Required for Prima Facie Obviousness*

In addition, regarding the required reasonable expectation of success, as evidenced from previous arguments regarding Gotoh, Chapman, and Barker's disclosures, Applicants submit that there would be no reasonable expectation of success to be derived from modifying Gotoh with either or both of Chapman and Barker, as this would diverge at least from Applicants' claimed "forming a soluble thin film by distributing and baking a coating solution on a film to be processed which is formed on a semiconductor substrate, wherein the soluble thin film is soluble in a dissolving liquid and contains an inorganic compound" (claim 1). This also demonstrates

that the Examiner's reliance on Gotoh, Chapman, and Barker is not sufficient to establish *prima facie* obviousness.

Since Applicants have already demonstrated: (1) deficiencies in the cited references, (2) that they are not combinable to produce the present claimed invention, (3) that they teach away from the present invention, and (4) that they do not provide any suggestion or motivation to produce the present claimed invention, it logically flows that there would be no reasonable expectation of success expected by one of ordinary skill in the art when combining Gotoh, Chapman, and Barker.

In summary, the Examiner has not met any of the essential criteria for establishing a *prima facie* case of obviousness. Applicants have demonstrated above that the Examiner: (a) has not shown that all recitations of Applicants' claimed invention are taught or suggested by Gotoh, Chapman, or Barker; (b) has not shown any requisite suggestion or motivation to modify Gotoh, Chapman, or Barker to produce Applicants' claimed invention; and (c) has not shown there would be any reasonable expectation of success from modifying Gotoh, Chapman, or Barker in order to produce the present claimed invention. Thus, Applicants submit that the Examiner's reliance on these references fails to establish *prima facie* obviousness.

Finally, Applicants note that the M.P.E.P. sets forth that "[i]f an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious."

M.P.E.P. § 2143.03.

Therefore, Applicants submit that independent claim 1 is allowable, for the reasons argued above. In addition, dependent claims 2 – 5 are also allowable at least by virtue of their dependence from allowable base claim 1. Therefore, Applicants respectfully submit that the Examiner should withdraw this 35 U.S.C. § 103(a) rejection.

FINNEGAN  
HENDERSON  
FARABOW  
GARRETT &  
DUNNER LLP

1300 I Street, NW  
Washington, DC 20005  
202.408.4000  
Fax 202.408.4400  
www.finnegan.com



**Regarding the Rejection of Claims 21 – 23 under 35 U.S.C. § 103(a):**

Applicants respectfully traverse the rejection of claims 21 – 23 under 35 U.S.C. § 103(a) as unpatentable over Gotoh in view of Chapman, Barker, and Harada. Applicants respectfully disagree with the Examiner's arguments and conclusions, and submit that a *prima facie* case of obviousness has not been established.

The requirements for establishing a *prima facie* case of obviousness have been set forth previously. Gotoh in view of Chapman, Barker, and Harada, does not teach or suggest at least the elements of Applicants' independent claim 21.

**Prior Art Reference Must Teach or Suggest All the Claim Elements**

Applicants' independent claim 21 also includes, among other things, the step of "forming a soluble thin film by distributing and baking a coating solution on a film to be processed which is formed on a semiconductor substrate, wherein the soluble thin film is soluble in a dissolving liquid and contains an inorganic compound." Applicants have already established in the previous section that Gotoh, Chapman, and Barker, taken alone or in combination, do not teach or suggest at least this element of Applicants' claimed invention.

In addition, the Examiner admitted that "Gotoh et al. fail to teach forming a soluble thin film which is soluble in a dissolving liquid on a film to be processed which is formed on the semiconductor substrate; and dissolving an etched soluble thin film in the dissolving liquid, thereby lifting off the mask pattern from the film to be processed" (Final Office Action, p. 4).

The Examiner then admitted deficiencies in the combination of Gotoh and Chapman, wherein "[t]he combined teachings of Gotoh et al. and Chapman fail to teach forming the soluble film by distributing and baking a coating solution" (Final Office Action, p. 5).

Further, the Examiner admitted deficiencies in the combination of Gotoh, Chapman, and Barker, in that “Gotoh et al. in combination with Chapman and Barker fail to teach forming an organic antireflection film on the mask layer before the step of forming the resist pattern; and etching the antireflection film and the mask layer using the resist pattern as a mask to form a mask pattern” (Final Office Action, p. 5).

In addition to the arguments presented against the applicability of Gotoh, Chapman, and Barker, in the previous section, Applicants submit that Harada does not cure the deficiencies of any or all of Gotoh, Chapman, and Barker. Harada does not cure the deficiencies of Gotoh, Chapman, and Barker, in that Harada does not teach or suggest at least the elements of Applicants’ claim 21 lacking in Gotoh, Chapman, and Barker. In contrast to the present invention, Harada teaches a different semiconductor layer structure, and different photolithography steps, as evidence by the description in col. 5, lines 10 – 55. This too is clearly different from at least Applicants’ claimed “forming a soluble thin film by distributing and baking a coating solution on a film to be processed which is formed on a semiconductor substrate, wherein the soluble thin film is soluble in a dissolving liquid and contains an inorganic compound.”

This conclusively demonstrates just some of the differences between Gotoh, Chapman, Barker, Harada, and Applicants’ present claimed invention. The Examiner has therefore not met at least one of the essential criteria for establishing a *prima facie* case of obviousness, wherein “the prior art reference (or references when combined) must teach or suggest all the claim limitations.” See M.P.E.P. §§ 2142, 2143, and 2143.03.

FINNEGAN  
HENDERSON  
FARABOW  
GARRETT &  
DUNNER LLP

1300 I Street, NW  
Washington, DC 20005  
202.408.4000  
Fax 202.408.4400  
www.finnegan.com

*Suggestion or Motivation to Modify or Combine Reference Teachings*

As such, the present invention, as recited in independent claim 21, cannot be attained based merely on a combination of Gotoh, Chapman, Barker, and/or Harada. One skilled in the art would only arrive at the present claimed invention by consulting Applicants' disclosure. Therefore, the only way to construct the claimed invention from Gotoh, Chapman, Barker, and/or Harada would require reliance on aspects related to the present invention. Such reliance, however, would constitute improper hindsight reasoning. Applicants note that one of ordinary skill in the art must have motivation or reason *without the benefit of Applicants' specification* to modify the references.

As already demonstrated, Gotoh, Chapman, Barker, and/or Harada, taken as-is or modified, *a priori* fails to establish obviousness of the claimed invention. Furthermore, Applicants have pointed out deficiencies in the cited prior art that render nugatory any indication that the cited references would give motivation or reason to one of ordinary skill in the art to modify them *without the benefits of Applicants' specification*.

Therefore, Applicants submit that Gotoh, Chapman, Barker, and/or Harada do not suggest the desirability of any modification to result in Applicants' claimed invention.

*Reasonable Expectation of Success Required for Prima Facie Obviousness*

In addition, regarding the required reasonable expectation of success, as evidenced from previous arguments regarding Gotoh, Chapman, Barker, and/or Harada, Applicants submit that there would be no reasonable expectation of success to be derived from modifying Gotoh, Chapman, Barker, and/or Harada, as this would diverge from at least the above-quoted elements of Applicants' independent claim 21.

Since Applicants have already demonstrated: (1) deficiencies in Gotoh, Chapman, Barker, and Harada, (2) that they do not provide any suggestion or motivation to produce the present claimed invention, it logically flows that there would be no reasonable expectation of success expected by one of ordinary skill in the art when using Gotoh, Chapman, Barker, and/or Harada in an attempt to achieve the benefits of Applicants' present claimed invention.

In summary, the Examiner has not met any of the essential criteria for establishing a *prima facie* case of obviousness. Applicants have demonstrated above that the Examiner: (a) has not shown that all recitations of Applicants' claimed invention are taught or suggested by Gotoh, Chapman, Barker, and/or Harada; (b) has not shown any requisite suggestion or motivation to modify Gotoh, Chapman, Barker, and/or Harada to produce Applicants' claimed invention; and (c) has not shown there would be any reasonable expectation of success from modifying Gotoh, Chapman, Barker, and/or Harada in order to produce the present claimed invention. Thus, Applicants submit that the Examiner's reliance on these references fails to establish *prima facie* obviousness.

Therefore, Applicants submit that independent claim 21 is allowable, for the reasons argued above, and that claims 22 and 23 are also allowable at least by virtue of their dependence from allowable base claim 21. Applicants respectfully submit that the Examiner should withdraw this 35 U.S.C. § 103(a) rejection.

**Conclusion:**

In view of the foregoing, Applicants request reconsideration of the application and submit that the rejections detailed above should be withdrawn. This Amendment after Final should allow for immediate and favorable action by the Examiner. Applicants submit that

pending claims 1 – 5 and 21 – 24 are in condition for allowance for the reasons presented above.

A favorable action is requested.

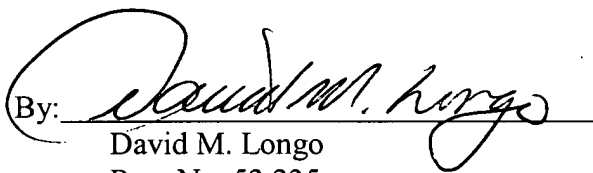
Should the Examiner continue to dispute the patentability of the claims after consideration of this Amendment after Final, Applicants encourage the Examiner to contact Applicants' undersigned representative by telephone to discuss any remaining issues or to resolve any misunderstandings. Applicants' undersigned representative would welcome the opportunity to discuss the merits of the present invention with the Examiner if telephone communication will aid in advancing prosecution of the present application.

Please grant any extensions of time under 37 C.F.R. § 1.136 required in entering this response. If there are any fees due under 37 C.F.R. § 1.16 or 1.17 including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

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By:   
David M. Longo  
Reg. No. 53,235

/direct telephone: (202) 408-4489/

FINNEGAN  
HENDERSON  
FARABOW  
GARRETT &  
DUNNER LLP

1300 I Street, NW  
Washington, DC 20005  
202.408.4000  
Fax 202.408.4400  
www.finnegan.com